

Application No. 10/625,250
Amdt. dated June 23, 2005
Reply to Office Action dated September 22, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-15 (cancelled)

Claim 16 (currently amended): A signal processing method for use in determination of a desired parameter of a sample, the method comprising the steps of:

- providing a measured signal representative of a response of the sample to an external field, the measured signal comprising a signal component indicative of the desired parameter, and a noise component, the signal component being a substantially periodic signal characterized by a substantially well-defined peak-to-peak intensity value;
- determining an upper envelope of the measured signal;
- determining a lower envelope of the measured signal: and
- analyzing the upper and lower envelope values to extract the signal component from the measured signal, to enable further processing of the extracted signal component to determine the desired parameter, wherein the analyzing step includes the step of determining a median of the difference between the upper and lower envelope values as an AC component.

Claim 17 (original): The method, as set forth in claim 16, wherein the step of providing the measured signal includes the step of sampling and frequency filtering of the response.

Application No. 10/625,250
Amdt. dated June 23, 2005
Reply to Office Action dated September 22, 2005

Claim 18 (cancelled)

Claim 19 (currently amended): A method for processing a measured signal including a first signal component in the form of a substantially periodic signal with substantially well-defined peak-to-peak intensity value, and a second signal component characterized by a specific asymmetric shape, to extract the signal components from noise components, the method comprising the steps of:

- processing the measured signal by determining an upper envelope and a lower envelope thereof, and analyzing the upper and lower envelope values to extract the first signal component, wherein the analyzing step includes the step of determining a median of the difference between the upper and lower envelope values as an AC component; and
- defining a kernel function being a derivative of a Gaussian with parameters matching characteristics of the second signal component, and processing the measured signal by filtering it with the kernel function parameters, thereby enhancing the second signal component relative to the noise component in the filtered measured signal.

Claims 20-22 (cancelled)

Claim 23 (currently amended): A control unit for use with a measurement device to receive and process a measured signal generated by the measurement device so as to extract a signal component from a noise component in the measured signal, the signal component being a substantially periodic signal with substantially well-defined peak-to-peak intensity value, the control unit comprising a data processing and analyzing utility preprogrammed to determine

Application No. 10/625,250
Amdt. dated June 23, 2005
Reply to Office Action dated September 22, 2005

upper and lower envelopes of the measured signal, and analyzing the upper and lower envelope values to extract the signal component by determining a median of the difference between the upper and lower envelope values as an AC component.

Claims 24-31 (cancelled)

Claim 32 (currently amended): A computer program storage device readable by a machine, tangibly embodying a program of instructions executable by a machine to perform method steps of processing a measured signal to extract a signal component and suppress a noise component of the measured signal, wherein the signal component is a substantially periodic signal characterized by a substantially well-defined peak-to-peak intensity value, which method comprises the steps of:

- (i) determining an upper envelope of the measured signal;
- (ii) determining a lower envelope of the measured signal, and
- (iii) analyzing the upper and lower envelope values to extract the signal component from the measured signal, wherein the analyzing step includes the step of determining a median of the difference between the upper and lower envelope values as an AC component.

Claims 33-48 (cancelled)

Claim 49 (currently amended): A method for determining first and second parameters of a signal, the signal having first and second signal components, comprising:

- (i) determining an upper envelope of the signal;

Application No. 10/625,250
Amdt. dated June 23, 2005
Reply to Office Action dated September 22, 2005

- (ii) determining a lower envelope of the signal;
- (iii) analyzing the upper and lower envelopes to extract the first signal component of the signal, wherein the analyzing step includes the step of determining a median of the difference between the upper and lower envelopes as an AC component;
- (iv) determining the first parameter of the signal as a function of the first signal component;
- (v) defining a kernel function as a derivative of a Gaussian with parameters matching characteristics of the second signal component; and
- (vi) applying a spectral filter to the signal, the spectral filter using the kernel function and responsively enhancing the second signal component; and;
- (vii) determining a second parameter of the signal as a function of the enhanced second signal component.

Claim 50 (currently amended): An apparatus, comprising: a detector for receiving a measured signal; and, a controller coupled to the detector and adapted to receive the measured signal, determine upper and lower envelopes of the measured signal, analyze the upper and lower envelopes to extract a signal component of the signal by determining a median of the difference between the upper and lower envelopes as an AC component, and to determine a parameter of the signal as a function of the signal component.

Claim 51 (original): An apparatus, as set for in claim 50, wherein the signal component is substantially periodic.

Application No. 10/625,250
Amdt. dated June 23, 2005
Reply to Office Action dated September 22, 2005

Claim 52 (original): An apparatus, as set forth in claim 50, wherein the signal component has a substantially defined peak-to-peak intensity value.

Claim 53 (original): An apparatus, as set forth in claim 50, including an emitter to apply an external field to a sample, wherein the signal is a response of the sample to the external field.

Claim 54 (original): An apparatus, as set forth in claim 53, wherein the parameter of the signal corresponds to a physiological parameter of the sample.

Claim 55 (original): An apparatus, as set forth in claim 54, wherein the physiological parameter is pulsatile blood-related.

Claim 56 (original): An apparatus, as set forth in claim 54, wherein the physiological parameter is oxyhemoglobin saturation.

Claim 57 (original): An apparatus, as set forth in claim 50, wherein the controller is adapted to extract the signal component of the signal by determining a median of the difference between upper and lower envelope values.

Claim 58 (original): An apparatus, as set forth in claim 57, wherein the median is an alternating value in the signal component.

Application No. 10/625,250
Amdt. dated June 23, 2005
Reply to Office Action dated September 22, 2005

Claim 59 (original): An apparatus, as set forth in claim 57, wherein the median is a constant value in the signal component.

Claims 60-61 (cancelled)